UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/829,418	04/21/2004	Chun-hyuk Lee	04103-P0007A	9093

24126 7590 08/01/2006

ST. ONGE STEWARD JOHNSTON & REENS, LLC
986 BEDFORD STREET
STAMFORD, CT 06905-5619

EXAMINER	
VALENROD, YEVGENY	
ART UNIT	PAPER NUMBER
1621	

DATE MAILED: 08/01/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/829,418	LEE ET AL.	
	Examiner	Art Unit	
	Yevgeny Valenrod	1621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-14 is/are pending in the application.

4a) Of the above claim(s) 12-14 is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-11 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 21 April 2004 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 4.21.04.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

Restriction to one of the following inventions is required under 35 U.S.C. 121:

I. Claims 1-11 are drawn to a method for preparing hydrazodicarbonamide, classified in class 564, subclass 35.

II. Claims 12-14 are drawn to an apparatus for preparing hydrazodicarbonamide, classified in class 422, subclass 188.

Inventions I and II are related as process and apparatus for its practice. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another and materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP § 806.05(e)). In this case the process of claims 1-11 does not require the apparatus of claims 12-14. The three steps of the process as described in claim 1 can be practiced by hand. WO 01/49652 describes a method of obtaining monohalobiuret compound by reacting the biuret of applicants' formula 1 with metal hypohalogen compound (see pages 10-11, Preparation 1). The claimed apparatus is therefore not required in order to practice the applicants' invention.

Because these inventions are independent or distinct for the reasons given above and the inventions require a different field of search (see MPEP § 808.02), restriction for examination purposes as indicated is proper.

During a telephone conversation with Stephen McNamara on June 30th 2006 a provisional election was made without traverse to prosecute the invention of "method for preparing hydrazodicarbonamide", claims 1-11. Affirmation of this election must be made by applicant in replying to this Office action. Claims 12-14 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Claim Rejections - 35 USC § 112

Claim 11 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The method of claim one comprises 3 reactions. Applicant states that the listed solvents are to be used for the reaction. It is not clear which of the reactions that comprise the method of claim 1 the recited solvent is intended for. In order to advance the prosecution of the application, the examiner will interpret the list of solvents to be applicable to any reaction in the method of claim 1.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-4 and 6-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al (WO 01/49652 A1) in view of Olin et al. (US 2,370,065).

The instant application claims a method for preparing hydrazodicarbonamide. The said method comprises three steps:

Step 1 - Pyrolysis of urea to form biuret and ammonia. Additional limitations to this step are found in claims 2-5 include: temperature in the range of 100 to 300^{0}C (claim 2), removal of ammonia from the reaction system (claim 3), pyrolysis being conducted under reduced pressure or with injection of inert gas (claim 4), a catalyst being employed in the pyrolysis process (claim 5).

Step 2 – Obtaining metal monohalobiuret of formula 2 or 3 (see claim 1). Additional limitation to step two include: 1 : 0.1 – 1 : 2 mole ration of biuret and metal hypohalogen (claim 6), either metal hydroxide followed by halogen or gaseous halogen used in the reaction (claim 7), reaction being conducted at a temperature below 60^{0}C (claim 8).

Step 3 – Reacting monohalobiuret salt with ammonia. Additional limitation of step 3 include: Ammonia used is liquid, gas, or ammonium hydrate (claim 9), temperature for step 3 being 0 - 150^{0}C.

Additional limitation of Claim 11 includes use of a solvent or mixture of solvents as listed in claim 11.

Scope of prior art

Lee et al. teach steps 2 and 3 and (as specified above) of the instantly claimed invention.

Step 2 is described on page 6, line 10 through page 7, line 21. The description includes 3 ways of practicing step 2 which include using halogen gas (page 7, Reaction 10 and lines 4-10), metal hypohalogen (page 6, reactions 8 and 9, lines 12-23) and metal hydroxide followed by halogen gas (17 –21). The temperature of the process is within the range of –5 to 30^{0}C, which is below 60^{0}C (page 7, line 21) (claim 8). The ratio of metal hypohalogen to biuret is 0.1 : 1 to 2 : 1 (page 6 lines 24-25) (claim 6).

Step 3 is described on page 4, line 12 through page 5, line 26. Ammonia can be liquid, gaseous, or ammonia water (page 5 lines 4-7) (claim 9). Solvent and solvent mixtures include water and its mixture with methanol, propanol, ethanol, DMF... (Page 5, lines 11-17) (Claim 11). The temperature at which the reaction is carried out is 30 to 150^{0}C (page 5 lines 2-3) (claim 10).

Ascertaining the difference between prior art and the instantly claimed invention

Lee et al. teach steps 2 and 3 of the instant invention. However they don't teach how the biuret required for step 2 is obtained. The said process constitutes step 1 of the instant invention.

Secondary reference

Olin et al. teach a method producing the biuret via urea pyrolysis. Olin et al. recite removing the ammonia from the process by using an inert gas (column 2, lines 2-12) (limitations of claims 3 and 4). They also teach performing the pyrolysis at a temperature range of 130 to 200^{0}C (column 1, line11) (limitation of claim 2).

Motivation to combine

One wishing to practice the invention of Lee et al. would invariably need a method of obtaining the biuret starting material. Olin et al. teach the method of producing biuret and the said method has advantages over other known methods, advantages such as avoiding the difficulties of removing ammonia from the reaction process. One of ordinary skill in the art would be motivated to combine, with reasonable expectation of success, the process of making biuret as taught by Olin et al. with the method of using a biuret to prepare hydrazodicarbonamide as taught by Lee et al.

Claims 1-2 and 4-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al. as applied to claims 1-4 and 6-11 above, and further in view of Garbo (US 2,524,049)

Ascertaining the difference between prior art and instant claims

Lee et al. teach a method of producing hydrazodicarbonamide from biuret (see details above). Lee et al. do not teach the method of producing the biuret.

Secondary Reference

Garbo teaches a method of producing biuret via urea pyrolysis. Garbo further teaches that the production of biuret is benefited by introduction of a catalyst or catalysts. Catalysts that were efficient in improving the yield of biuret production are discussed in column 1, lines 28-53 and include acids (tungstic acid, line37) and phosphorus compounds (lines 42-44). Gorbo also teaches a temperature range for the pyrolysis being 140-200^{0}C (column 2, line6), and performing the reaction under reduced pressure (column2, line 43-44).

Motivation to combine

A person of ordinary skill in the art wishing to prepare hydrazodicarbonamide would be motivated to combine, with reasonable expectation of success, the teachings of Lee et al. and Garbo. The method of preparing a biuret taught by Garbo has advantages over other know similar processes, such as performing the reaction at reduced pressure (column 2, line 46-47). Combining Lee et al. and Garbo teaches all the limitations of the instant claim 1, 2 and 4-11.

Double Patenting

Claims 1-4, 6-11 rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-8, 10 and 11 of U.S. Patent No. 6,635,785 in view of Olin et al. (US 2,370,065).

The instant application claims a method for preparing hydrazodicarbonamide. The said method comprises three steps:

Step 1 - Pyrolysis of urea to form biuret and ammonia. Additional limitations to this step are found in claims 2-5 include: temperature in the range of 100 to 300^{0}C (claim 2), removal of ammonia from the reaction system (claim 3), pyrolysis being conducted under reduced pressure or with injection of inert gas (claim 4), a catalyst being employed in the pyrolysis process (claim 5).

Step 2 – Obtaining metal monohalobiuret of formula 2 or 3 (see claim 1). Additional limitation to step two include: 1 : 0.1 – 1 : 2 mole ration of biuret and metal hypohalogen (claim 6), either metal hydroxide followed by halogen or gaseous halogen used in the reaction (claim 7), reaction being conducted at a temperature below 60^{0}C (claim 8).

Step 3 – Reacting monohalobiuret salt with ammonia. Additional limitation of step 3 include: Ammonia used is liquid, gas, or ammonium hydrate (claim 9), temperature for step 3 being 0 - 150^{0}C. Additional limitation of Claim 11 includes use of a solvent or mixture of solvents as listed in claim 11.

Primary Reference

6,635,785 teaches Steps 2 and 3 (instant claim 1) and the subsequent limitation of steps 2 and 3, which are found in claims 6-11 of the instant application.

Step 2 and its limitation are found in claims 2, 3, 4 and 5 of 6,635,785. Claims 2 and 4 teach the limitation of the instant claim 7, claim 3 teaches the limitation of the instant claim 6 (reagent ratio) and claims 5 and 7 teach the limitation of the instant claim 8 (Temperature for the process).

Step 3 and its limitations are found in claims 1, 8, 10 and 11 of 6,635,785. Claim 1 teaches the reaction of Step 3, claim 8 teaches the limitation of the instant claim 9 (ammonia can be liquid, gaseous or ammonium hydroxide), claim, claim 10 teaches the limitation of the instant claim 10 (temperature for reaction 30-150^{0}C), claim 11 teaches the limitation of the instant claim 11 (solvent is water).

Ascertaining the difference between 6,635,785 and the instant claims

Although the claims of 6,635,785 teach the process of steps 2 and 3 (steps are as defined above) of the instant application, it does not teach step 1, pyrolysis of urea to produce biuret. Claims 2-5 of the instant application are directed to the pyrolysis of urea. Claims 2-4 are taught by the secondary reference.

Secondary reference

Olin et al. teach a method producing the biuret via urea pyrolysis. Olin et al. recite removing the ammonia from the process by using an inert gas (column 2, lines 2-12) (limitations of claims 3 and 4). They also teach performing the pyrolysis at a temperature range of 130 to 200^{0}C (column 1, line11) (limitation of claim 2).

Motivation to combine

Olin et al. teach the method of producing biuret and the said method has advantages over other known methods, advantages such as avoiding the difficulties of

removing ammonia from the reaction process. One of ordinary skill in the art would be motivated to combine, with reasonable expectation of success, the process of making biuret as taught by Olin et al. with the method of using a biuret to prepare hydrazodicarbonamide as claimed in the U.S. Patent No. 6,635,785.

Claims 1, 2, 4-11 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-8, 10 and 11 of U.S. Patent No. 6,635,785 further in view of Garbo (US 2,524,049).

Ascertaining the difference between 6,635,785 and the instant claims

Although the claims of 6,635,785 teach the process of steps 2 and 3 (steps are as defined above) of the instant application, it does not teach step 1, pyrolysis of urea to produce biuret. Claims 2-5 of the instant application are directed to the pyrolysis of urea. Claims 2, 4 and 5 are taught by the secondary reference.

Secondary Reference

Garbo teaches a method of producing biuret via urea pyrolysis. Garbo further teaches that the production of biuret is benefited by introduction of a catalyst or catalysts. Catalysts that were efficient in improving the yield of biuret production are discussed in column 1, lines 28-53 and include acids (tungstic acid, line37) and phosphorus compounds (lines 42-44) (instant claim 5). Gorbo also teaches a temperature range for the pyrolysis being 140-200^{0}C (column 2, line6) (instant claim 2), and performing the reaction under reduced pressure (column2, line 43-44) (instant claim 4).

Motivation to combine

A person of ordinary skill in the art wishing to prepare hydrazodicarbonamide would find it obvious to combine, with reasonable expectation of success, the method described in U.S. Patent No. 6,635,785 and the process taught by Garbo. The method of preparing a biuret taught by Garbo has advantages over other know similar processes, such as performing the reaction at reduced pressure (column 2, line 46-47). Combining Garbo with the claims of 6,635785 teaches all the limitations of the instant claims 1, 2 and 4-11.

Conclusion

- Claims 1-14 are pending
- Claims 12-14 are withdrawn as related to non-elected subject matter
- Claims 1-11 are rejected

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yevgeny Valenrod whose telephone number is 571-272-9049. The examiner can normally be reached on 8:30am-5:00pm M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thurman Page can be reached on 571-272-0602. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Yevgeny Valenrod
Patent Examiner
Technology Center 1600

THURMAN K. PAGE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1600

Thurman Page
Supervisory Patent Examiner
Technology Center 1600